United Nations A/68/189

General Assembly

Distr.: General
29 July 2013

Original: English

Sixty-eighth session
Item 99 (c) of the provisional agenda*
General and complete disarmament: transparency and confidence-building measures in outer space activities

Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities

Note by the Secretary-General

The Secretary-General has the honour to transmit herewith the report of the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities. The Group was established pursuant to General Assembly resolution 65/68.

* A/68/150.

13-40835 (E) 190813

Please recycle

Report of the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities

Summary

The present report contains the study on outer space transparency and confidence-building measures conducted by the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities, which was established by the Secretary-General of the United Nations. The study was adopted by consensus. The Group concluded that the world's growing dependence on space-based systems and technologies and the information they provide requires collaborative efforts to address threats to the sustainability and security of outer space activities. Transparency and confidence-building measures can reduce, or even eliminate, misunderstandings, mistrust and miscalculations with regard to the activities and intentions of States in outer space.

The Group acknowledged that the existing treaties on outer space contain several transparency and confidence-building measures of a mandatory nature. Non-legally binding measures for outer space activities should complement the existing international legal framework pertaining to space activities and should not undermine existing legal obligations or hamper the lawful use of outer space, particularly by emerging space actors. The Group further agreed that such measures for outer space activities could contribute to, but not act as a substitute for, measures to monitor the implementation of arms limitation and disarmament agreements.

After extensive and in-depth discussions, the Group drafted a series of measures for outer space activities, including exchange of information relating to national space policy such as major military expenditure on outer space, notifications on outer space activities aimed at risk reduction, and visits to space launch sites and facilities. The Group discussed criteria for developing transparency and confidence-building measures in outer space activities and for testing their implementation and validation. In addition, the Group encouraged further development of international cooperation between spacefaring and non-spacefaring nations in the peaceful uses of outer space for the benefit of all States.

The proposed measures drafted by the Group also include coordination and consultative mechanisms aimed at improving interaction between participants in outer space activities and clarifying information and ambiguous situations. In order to promote effective implementation of the transparency and confidence-building measures, the Group recommended that coordination be established between the Office for Disarmament Affairs and the Office for Outer Space Affairs of the Secretariat.

The Group recommended that States and international organizations consider and implement the transparency and confidence-building measures contained in the present report on a voluntary basis and without prejudice to the implementation of obligations deriving from existing legal commitments.

The Group further recommended that the General Assembly decide how to best advance transparency and confidence-building measures and facilitate their universal consideration and support, including by the relevant offices of the Secretariat and the United Nations entities whose work relates to disarmament. The Group also requested the Secretary-General to circulate its report to all relevant entities of the United Nations system.

Foreword by the Secretary-General

The societies of our globalized world are increasingly dependent on the more than 1,000 operational satellites that orbit Earth. Space-based platforms can collect and almost instantly broadcast large amounts of information worldwide. The benefits derived from outer space resources are now fundamental components of our daily lives. From agriculture and weather forecasting to mapping and communications, space plays an ever-growing role in human activities and development.

However, outer space is a fragile environment where the steps taken by one actor may have an impact on others, including users of space services on Earth. The broader application of space operations and the increased strategic value of space have resulted in a growing focus on safety in outer space activities. Satellites provide strategic advantages but they are also vulnerable. Protecting space assets has thus become a serious international security concern.

The applicability of transparency and confidence-building measures for outer space activities was explored for the first time at the global level in 1993, when few countries were able to operate satellites and spacecraft. Today, more than 60 States, government consortiums and other entities own or operate space assets, and the number of spacefaring nations continues to grow. This fundamental change in the political climate surrounding outer space led me to establish, in 2012, the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities.

The present report contains the Group's conclusions and recommendations. It builds on the recommendations of a previous group of experts and on proposals for outer space transparency and confidence-building measures submitted to the United Nations by Member States.

The study reaffirms that international cooperation in the peaceful uses of outer space can help States to develop and strengthen their capacities to benefit from space activities. The Group agreed on a number of substantive transparency and confidence-building measures, which I commend to the General Assembly for consideration. I also support the Group's recommendation to establish coordination between various entities of the United Nations Secretariat and other institutions involved in outer space activities. This would facilitate the implementation of the transparency and confidence-building measures and promote their further development. Outer space is an inherently multilateral domain. If we are to continue to take advantage of the invaluable resources that outer space provides, it is critically important for all nations to work collectively to keep it free from destabilizing conflict and to make it safe, secure and sustainable in the long term for the benefit of all humankind.

Letter of transmittal

19 July 2013

I have the honour to submit herewith the report of the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities, established pursuant to General Assembly resolution 65/68. The members of the Group are as follows:

Brazil

Mr. João Marcelo **Galvão de Queiroz**
Head, Disarmament and Sensitive Technologies Division
Ministry of Foreign Relations
Brasilia

Chile

Mr. Helmut **Lagos**
Permanent Representative of Chile to the United Nations
Vienna

China

Mr. **Dai** Huaicheng
Director
Department of Arms Control and Disarmament
Ministry of Foreign Affairs
Beijing

France

Mr. Gérard **Brachet**
President, Academy of Air and Space
Paris

Italy

Mr. Sergio **Marchisio**
Director
Institute of International Legal Studies
National Research Council
Rome

Kazakhstan

Mr. Ruslan **Amirgereyev**
Head, Military Programmes Ministry of Defence
Astana

Nigeria

Mr. Augustine U. **Nwosa**
Minister
Permanent Mission of Nigeria to the United Nations
New York

Republic of Korea

Mr. Chulmin **Park**
Deputy Director General
International Organizations Bureau
Ministry of Foreign Affairs
Seoul

Romania

Mr. Dimitru-Dorin **Prunariu**
President
Scientific Council of the Romanian Space Agency
Bucharest

Russian Federation

Mr. Victor L. **Vasiliev**
Deputy Permanent Representative
Mission of the Russian Federation to the United Nations
and other international organizations (Geneva)
Geneva

Sri Lanka

Mr. Musthafa M. **Jaffeer**
Ambassador of Sri Lanka to Norway
Oslo

Ukraine

Mr. Andrii **Kasianov**
Counsellor
Division of Disarmament and Non-proliferation
Ministry of Foreign Affairs
Kyiv
(First session)

Mr. Borys **Atamanenko**
Head
International Relations Department State Space Agency
Kyiv
(Second and third sessions)

United Kingdom of Great Britain and Northern Ireland

Mr. Richard **Crowther**
Chief Engineer
United Kingdom Space Agency
Swindon, Wiltshire

United States of America

Mr. Frank A. **Rose**
Deputy Assistant Secretary of State
Space and Defence Policy
Bureau of Arms Control, Verification and Compliance
Department of State
Washington, D.C.

The report was prepared between July 2012 and July 2013, during which period the Group of Governmental Experts held three sessions: the first and third sessions were held in New York, from 23 to 27 July 2012 and from 8 to 12 July 2013 respectively, and the second session was held in Geneva, from 1 to 5 April 2013.

In carrying out its work, the Group took into account the report of the Secretary-General entitled "Study on the application of confidence-building measures in outer space" (A/48/305 and Corr.1). It also considered a number of proposals from experts and from States that were not represented by experts in the Group.

With the purpose of preparing a comprehensive study, the Group authorized the Chair to conduct consultations during the intersessional periods with intergovernmental organizations involved in the peaceful exploration and use of outer space. The Chair briefed the Conference on Disarmament and the Committee on the Peaceful Uses of Outer Space about discussions within the Group. In addition, he conducted consultations with the International Telecommunication Union and the World Meteorological Organization.

Following extensive and in-depth discussions, the experts agreed upon a set of transparency and confidence-building measures for outer space activities and recommended that States consider and implement them on a voluntary basis. The measures include the exchange of different types of information relating to space policy and activities, risk reduction notifications and expert visits to national space facilities.

The Group recommended that the General Assembly decide how to further advance transparency and confidence-building measures and provide for their universal consideration and support. In addition, it requested the Secretary-General to circulate the present report to the Committee on the Peaceful Uses of Outer Space and other relevant entities of the United Nations system. Efforts should also be made to reach universal participation in, implementation of and full adherence to the existing legal agreements relating to outer space activities. The Group stressed that the implementation of those international agreements in combination with the transparency and confidence-building measures recommended in the report would constitute an essential element for building a climate of trust and confidence among States.

The members of the Group wish to express their appreciation for the assistance they received from members of the United Nations Secretariat, in particular those who served as Secretaries of the Group. The Group also wishes to express its appreciation for the contribution of the United Nations Institute for Disarmament Research, which served as consultant to the Group.

I have been requested by the Group of Governmental Experts, as its Chair, to submit to you, on its behalf, the present report, which was approved by consensus.

(*Signed*) Victor L. **Vasiliev**
Chair
Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities

I. Introduction

1. Pursuant to General Assembly resolution 65/68, the Secretary-General established the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities, on the basis of equitable geographical representation, with the purpose of conducting a study on outer space transparency and confidence-building measures, making use of the relevant reports of the Secretary-General. The General Assembly has noted the need to conduct the study, without prejudice to the substantive discussions on the prevention of an arms race in outer space within the framework of the Conference on Disarmament.

2. The present report reflects the recommendations of the Group of Governmental Experts on possible transparency and confidence-building measures in outer space activities that could be adopted voluntarily by States on a unilateral, bilateral, regional or multilateral basis. Section II contains background information on the subject and section III contains information on the general characteristics and basic principles of outer space transparency and confidence-building measures. Sections IV-VIII reflect the specific measures recommended by the Group on transparency and confidence-building measures in outer space activities and section IX contains conclusions and recommendations with regard to the implementation of the measures presented in sections IV-VIII.

3. For the preparation of the report, the Group carried out a wide range of consultations and received input from Member States, international organizations and civil society.

II. Background

4. From communications, financial operations, farming, weather forecasting and environmental monitoring to navigation, surveillance and treaty monitoring, outer space resources play a key role in the social, economic, scientific and technological activities of all nations, as well as in the field of international peace and security.

5. Today, there are more than 1,000 operational satellites in orbit around the Earth. More than 60 States, government consortiums and other entities own or operate those space assets and more and more States are becoming spacefaring nations and/or increasing their space-based capabilities and resources.

6. The result of the increase in space actors and space users is that the space environment, especially key Earth orbits, is becoming increasingly congested, contested and competitive. In the context of international peace and security, there is growing concern that threats to vital space capabilities may increase during the next decade as a result of both natural and man-made hazards and the possible development of disruptive and destructive counterspace capabilities.

7. In addition to the growth of space actors and space resource users, since the last study by governmental experts on the application of confidence-building measures in outer space (A/48/305 and Corr.1), the political climate regarding outer space sustainability and security has fundamentally changed, as reflected in, inter alia, the resolutions adopted by the General Assembly on transparency and confidence-building measures and the substantive discussions of the Conference on Disarmament on the prevention of an arms race in outer space and of the Working

Group on the Long-Term Sustainability of Outer Space Activities of the Committee on the Peaceful Uses of Outer Space, as well as the activities of the International Telecommunication Union (ITU) and the World Meteorological Organization (WMO). Various proposals have also been put forward, including a draft treaty on prevention of the placement of weapons in outer space and of the threat or use of force against outer space objects (see CD/1839) and the European Union proposal for an international code of conduct for outer space activities.

8. The Group recognized the invaluable role played by the existing international treaties on outer space, especially the Treaty on the Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, in consolidating a legal regime aimed at fostering use of outer space and strengthening international cooperation in outer space activities. In that context, the Group recognized that States are ultimately responsible for the authorization and continuing supervision of all space activities under their jurisdiction. Under the legal framework of those treaties and other instruments that may also be relevant and applicable to the space environment in that context, use of outer space by States, international organizations and private entities has flourished. As a result, space technology and services contribute immeasurably to economic growth and improvements in the quality of life around the world.

9. With regard to maintaining international peace and security, it is clear that it is in the interest of all nations to act responsibly and in accordance with international law when carrying out outer space activities, in order to help to prevent mishaps, misperceptions and miscalculations. As more governmental and non-governmental entities become involved in outer space activities, greater international cooperation is needed to uphold the long-standing principle that the exploration and use of outer space should be carried out for the benefit and in the interests of all countries. Such cooperation is essential if the international community is to succeed in safeguarding the use of outer space for peaceful purposes and for future generations.

10. The Group noted that efforts by States, and the international community as a whole, are being undertaken to advance concerted, well-thought out, effective and timely bilateral, regional and multilateral initiatives to strengthen stability and security in outer space in a constructive manner.

11. The work that takes place within the Committee on the Peaceful Uses of Outer Space, its Scientific and Technical Subcommittee and its Legal Subcommittee, makes a significant contribution to the promotion of the long-term sustainability of outer space activities. The Committee and its Subcommittees play a central role in the development of treaties, principles and guidelines related to outer space activities.

12. In 2010, the Scientific and Technical Subcommittee established the Working Group on the Long-Term Sustainability of Outer Space Activities. The Working Group is mandated to prepare a report on the long-term sustainability of outer space activities and to recommend a set of guidelines focused on practical and prudent measures that could be implemented in a timely manner to enhance the safety and long-term sustainability of outer space activities.

13. The Group of Governmental Experts recognized the active participation of member States of the Committee on the Peaceful Uses of Outer Space in the development of those guidelines and noted the importance of their subsequent

implementation by all States and intergovernmental organizations. In some respects, the guidelines will be similar to transparency and confidence-building measures and some of the guidelines could be considered as potential transparency and confidence-building measures, while others could provide the technical basis for the implementation of some of the transparency and confidence-building measures proposed by the Group of Governmental Experts. The report of the Working Group on the Long-Term Sustainability of Outer Space Activities will be presented to the Committee on the Peaceful Uses of Outer Space. Once the finalized guidelines are approved, they will be presented to the Fourth Committee of the General Assembly, and then to the General Assembly itself for endorsement and adoption.

14. The Group noted the extensive work of the First Committee of the General Assembly on confidence-building measures in various sectors. Specifically, the Group noted that the First Committee recommends for adoption by the Assembly a draft resolution on transparency and confidence-building measures in outer space activities on an annual basis. Additionally, the Group noted the concrete proposals from Member States on outer space transparency and confidence-building measures, as contained in the report of the Secretary-General entitled "Transparency and confidence-building measures in outer space activities" (A/65/123 and Add.1).

15. The Group noted that the agenda of the sessions of the Conference on Disarmament includes the item "Prevention of an arms race in outer space". In that context, several initiatives related to transparency and confidence-building measures have been proposed. They include, for example, working papers from Canada on transparency and confidence-building measures in outer space (CD/1815) and on the merits of certain draft transparency and confidence-building measures and treaty proposals for space security (CD/1865). Also of note is the draft treaty on prevention of the placement of weapons in outer space and of the threat or use of force against outer space objects (see CD/1839).

16. On 5 June 2012, the European Union presented a draft of a non-legally binding international code of conduct for outer space activities to the international community. The Group noted that the first open-ended consultations on the proposal were held in Kyiv on 16 and 17 May 2013.

17. The Group noted the role of ITU in the management of the radio frequency spectrum and geostationary orbital slots. In the context of transparency and confidence-building measures, the ITU Radiocommunication Bureau plays a key role in addressing harmful interference to radio services or communications, as provided for in article 45 of the ITU Constitution and article 15 of the ITU Radio Regulations. The Group also noted the importance of commitments to establish and implement policies and procedures to minimize any form of harmful interference in radio frequencies.

18. The Group noted that regional intergovernmental organizations provide useful platforms for the development and implementation of transparency and confidence-building measures related to coordination and international cooperation.

19. The Group noted that, since 2004, several States have introduced a policy of not being the first State to place weapons in outer space.

III. General characteristics and basic principles

A. Nature and purpose of outer space transparency and confidence-building measures

20. In general terms, transparency and confidence-building measures are a means by which Governments can share information with the aim of creating mutual understanding and trust, reducing misperceptions and miscalculations and thereby helping both to prevent military confrontation and to foster regional and global stability. They also assist in building confidence as to the peaceful intentions of States and can help States to increase understanding, enhance clarity of intentions and create conditions for establishing a predictable strategic situation in both the economic and security fields.

21. Although there is no universal or comprehensive prescription for identifying transparency and confidence-building measures, there are certain characteristics that may be used to determine their effectiveness. In general, there are two types of transparency and confidence-building measures: those dealing with capabilities and those dealing with behaviours. The Group took note of the Guidelines for appropriate types of confidence-building measures and for the implementation of such measures on a global or regional level, as contained in the study on the application of confidence-building measures in outer space (A/48/305 and Corr.1, annex, appendix II).

22. Transparency and confidence-building measures have been employed in a number of terrestrial contexts for decades. They had an especially important role during the cold war, where they were intended to contribute to reducing the risk of armed conflict through mitigating misunderstandings related to military activities, particularly in situations where States lacked clear and timely information.

23. The Group was of the view that transparency and confidence-building measures developed in a multilateral framework are more likely to be adopted by the wider international community.

B. Transparency and confidence-building measures in outer space activities

24. The Group recognized that transparency and confidence-building measures, for the purpose of its study, should be considered as non-legally binding voluntary measures. At the same time, it noted that elements of transparency and confidence-building measures may be found in existing international agreements. The Group also discussed other measures, including those of a legally binding nature.

25. The Group recognized that the need for transparency and confidence-building measures in outer space activities has increased significantly over the past two decades. It is generally acknowledged that such measures can augment the safety, sustainability and security of day-to-day space operations and can contribute both to the development of mutual understanding and to the strengthening of friendly relations between States and peoples. That recognition has been reflected in numerous resolutions of the General Assembly.

26. Transparency and confidence-building measures for outer space activities are part of a broader context of such measures. The General Assembly endorsed, in its resolution 43/78 H, the guidelines for appropriate types of confidence-building measures, as adopted by the Disarmament Commission at its 1988 substantive session. In that resolution, the Assembly noted that confidence-building measures, while neither a substitute nor a precondition for arms limitation and disarmament measures, can be conducive to achieving progress in disarmament.

27. The Group identified the following transparency and confidence-building measures for outer space activities as being of relevance:

(a) General transparency and confidence-building measures aimed at enhancing the availability of information on the space policy of States involved in outer space activities;

(b) Information exchange about development programmes for new space systems, as well as information about operational space-based systems providing widely used services such as meteorological observations or global positioning, navigation and timing;

(c) Dissemination of information on a State's principles and goals relating to their exploration and use of outer space for peaceful purposes;

(d) Specific information-exchange measures aimed at expanding the availability of information on objects in outer space and their general function, particularly those objects in Earth orbits;

(e) Measures related to establishing norms of behaviour for promoting spaceflight safety such as launch notifications and consultations that aim at avoiding potentially harmful interference, limiting orbital debris and minimizing the risk of collisions with other space objects;

(f) International cooperation measures in outer space activities, including measures aimed at promoting capacity-building and disseminating data for sustainable economic and social development, that are consistent with existing international commitments and obligations.

28. The Group agreed that transparency and confidence-building measures for outer space activities can also contribute to, but not act as a substitute for, measures to verify arms limitation and disarmament agreements.

29. The Group noted that some transparency and confidence-building measures for outer space activities have already been enacted at the multilateral and/or the national level. Such measures include pre-launch notifications, space situational awareness data-sharing, notifications of hazards to spaceflight safety and other significant events, and the publication of national space policies. Several countries have also proposed new voluntary unilateral or collective transparency and confidence-building measures in space.

C. Criteria for transparency and confidence-building measures in outer space

30. Transparency and confidence-building measures can be developed and implemented by States and intergovernmental organizations unilaterally, bilaterally, regionally and multilaterally. States should implement such measures to the greatest extent practicable and in a manner consistent with their national interests and obligations. Transparency and confidence-building measures promote mutual confidence among States through constructive dialogue and increased awareness and insight.

31. In general terms, transparency and confidence-building measures for outer space activities should be aimed at increasing the security, safety and sustainability of outer space. Particular attention should be given to the development and implementation of voluntary and pragmatic measures to ensure the security and stability of all aspects of outer space activities. In developing transparency and confidence-building measures for outer space activities, it is particularly important to be able to demonstrate the practicability of a particular measure or set of actions to the various actors involved, within the scope of that proposed measure or set of actions.

32. The Group observed that the existing treaties on outer space contain several transparency and confidence-building measures of a mandatory nature. Non-legally binding transparency and confidence-building measures for outer space activities should complement the existing international legal framework pertaining to outer space activities, and not undermine existing legal obligations or hamper the legal use of outer space, particularly by emerging space actors. Once adopted, transparency and confidence-building measures might have specific effects in a domestic context, especially with regard to their implementation through relevant national mechanisms.

33. Transparency and confidence-building measures for outer space activities should complement, but not act as a substitute for, the verification measures in arms control agreements and regimes. Voluntary measures could contribute to the consideration of concepts and proposals for legally binding arms control measures as well as verification protocols included in legally binding international instruments.

34. Proposed transparency and confidence-building measures should:

(a) Be clear, practical and proved, meaning that both the application and the efficacy of the proposed measure have been demonstrated by one or more actors;

(b) Reduce or even eliminate the causes of mistrust, misunderstanding and miscalculation with regard to the activities and intentions of States.

35. The table below sets out elements for testing the implementation, validation and demonstration of a transparency and confidence-building measure.

Testing a transparency and confidence-building measure

	Implementation	*Demonstration*
Who	Who should implement the measure?	Who will be able to confirm that the measure has been implemented?
What	What is the measure that should be implemented? Is it clearly identified and understood?	What should be demonstrated to confirm implementation?
Why	What is the value or benefit of performing the measure?	Does a clear understanding of why it is important to be able to confirm or demonstrate implementation exist?
When	When should the measure be implemented?	When should demonstration or confirmation be performed?
How	How should the measure be implemented?	How is implementation of the measure validated, demonstrated or confirmed?

IV. Enhancing the transparency of outer space activities

36. Regular and routine exchanges of information through bilateral, regional and multilateral mechanisms are intended to serve as opportunities for States to describe their current and planned space activities. States may exchange general information on their outer space policies and space activities and provide risk reduction notifications for foreseeable hazardous situations. Risks may include dangers to the lives or health of astronauts or to human spaceflight activity, as well as natural phenomena that may cause harm to spacecraft. States should be encouraged to share information with other governmental and non-governmental spacecraft operators and relevant international organizations in a timely manner. States may consider undertaking, on a voluntary basis, familiarization visits to space-related facilities.

A. Information exchange on space policies

Principles and goals of a State's outer space policy

37. States should publish information on their national space policies and strategies, including those relating to security. States should also publish information on their major outer space research and space applications programmes in order to build a climate of trust and confidence between States on military and non-military matters. This should be carried out in line with existing multilateral commitments. States may provide additional information reflecting their relevant defence policy, military strategies and doctrines.

Major military outer space expenditure and other national security space activities

38. Consistent with existing political commitments for national reporting on major military expenditure and guidelines and recommendations for objective information on military matters to all Member States, Governments should use existing mechanisms to report on their military space expenditure as well as other national security space activities. They may supplement such reports with explanatory remarks regarding submitted data to explain or clarify the figures provided in the reports, such as total national security space expenditure as a share of gross domestic product and major changes from previous reports.

B. Information exchange and notifications related to outer space activities

Orbital parameters of outer space objects and potential orbital conjunctions

39. Exchanges of information on the basic orbital parameters of outer space objects may assist in increasing the accuracy of the tracking of space objects. Specific measures could include:

(a) Exchange of information on the orbital elements of space objects and the provision, to the extent practicable, of notifications of potential orbital conjunctions involving spacecraft to relevant government and private sector spacecraft operators;

(b) Provision of registration information to the United Nations as soon as practicable, in accordance with the Convention on Registration of Objects Launched into Outer Space and General Assembly resolution 62/101, entitled "Recommendations on enhancing the practice of States and international intergovernmental organizations in registering space objects";

(c) Provision of public access to national registries of space objects.

Such notifications, through bilateral, regional and multilateral mechanisms, can provide transparency regarding specific space activities. Shared awareness of spaceflight activity may foster global spaceflight safety and avoid mishaps, misperceptions and mistrust.

Natural hazards in outer space

40. In accordance with the Outer Space Treaty, States should immediately inform other States or the Secretary-General of the United Nations of any phenomena they discover in outer space, including the Moon and other celestial bodies, which could constitute a danger to the life or health of astronauts or to human spaceflight activity. States should also consider providing, on a voluntary basis, timely information to other governmental and non-governmental spacecraft operators of natural phenomena that may cause harm to spacecraft engaged in the peaceful exploration and use of outer space.

Planned spacecraft launches

41. States should provide pre-launch notifications of space vehicle launches and the mission of launch vehicles. The Group noted that the Hague Code of Conduct against Ballistic Missile Proliferation contains an example of such a notification.

C. Risk reduction notifications

Scheduled manoeuvres that may result in risk to the flight safety of other space objects

42. States should notify, in a timely manner and to the greatest extent practicable, States that may be affected by scheduled manoeuvres that may result in risk to the flight safety of the space objects of other States.

Uncontrolled high-risk re-entry events

43. States should support the development and implementation of measures to exchange information with and notify, in a timely manner and to the greatest extent practicable, all States that may be affected by predicted high-risk re-entry events in which the re-entering space object or residual material from the re-entering space object could potentially cause significant damage or radioactive contamination. Such notifications could also be made to the Secretary-General and relevant international organizations.

Emergency situations

44. States should, in a timely manner and to the greatest extent practicable, notify all States that may be affected by events linked to natural and man-made threats to the flight safety of space objects. These may include risks caused by the malfunctioning of space objects or loss of control that could result in a significantly increased probability of a high-risk re-entry event or a collision between space objects.

Intentional orbital break-ups

45. Intentional destruction of any orbiting spacecraft or launch vehicle orbital stages or other harmful activities that generate long-life debris should be avoided. When intentional break-ups are determined to be necessary, States should inform States that may be affected of their plans, including measures that will be taken to ensure intentional destruction is conducted at sufficiently low altitudes to limit the orbital lifetime of resulting fragments. All actions should be carried out in conformity with the Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space, endorsed by the General Assembly in its resolution 62/217, entitled "International cooperation in the peaceful uses of outer space".

D. Contact and visits to space launch sites and facilities

Voluntary familiarization visits

46. Voluntary familiarization visits can provide opportunities to improve international understanding of a State's processes and procedures for space activities, including dual-use and military activities, and can provide context for the development and implementation of notifications and consultations.

Expert visits

47. Taking note of article X of the Outer Space Treaty, as well as other multilateral commitments, the Group encouraged States to consider, on a voluntary basis, honouring requests of experts to visit space facilities, including space launch sites,

and inviting international observers to launch sites, flight command and control centres and other operational facilities of outer space infrastructure, as well as space situational awareness centres.

Demonstrations

48. Demonstrations of rockets and other space-related technologies could be carried out on a voluntary basis and in line with existing multilateral commitments and national export control regulations.

V. International cooperation

49. International cooperation in the peaceful uses of outer space provides a basis for all States to develop and strengthen their capacity to undertake and/or derive benefits from space activities. International cooperation on scientific and technical projects between both spacefaring and non-spacefaring nations can contribute to confidence-building.

50. While there are a number of States that have acquired significant space-related capabilities, many non-spacefaring States have a strong desire to participate directly in outer space activities and to share in space technology.

51. As noted in the study on the application of confidence-building measures in outer space (A/48/305 and Corr.1), the disparity in the space capabilities of States, the inability to participate in space activities without the assistance of others, uncertainty concerning sufficient transfer of space technologies and the inability to acquire significant space-based information are factors in the lack of confidence among States. International cooperation is an important vehicle for promoting the right of each nation to achieve its legitimate objectives of benefiting from space technology for its own development and welfare.

52. The Group further noted that each State is free to determine the nature of its participation in international space cooperation on an equitable and mutually acceptable basis with regard to the legitimate rights and interests of parties' concerns, for example, appropriate technology safeguard arrangements, multilateral commitments and relevant standards and practices.

53. The Group agreed that the Outer Space Treaty should be regarded as a basis for the furthering of international cooperation in outer space activities and, in accordance with article I of the Treaty, that the exploration and use of outer space should be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and should be the province of all humankind.

54. The Group took note of the Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries (General Assembly resolution 51/122, annex) and specifically noted that the Declaration should form a basis for the development of international cooperation in outer space activities. Paragraphs 3 and 5 of the Declaration are of particular relevance.

55. Bilateral, regional and multilateral capacity-building programmes on space science and technologies can contribute to developing the space skills and

knowledge of educators and scientists in developing countries throughout the world. Such programmes should build capacity through a focus on theory, research, applications, field exercises and pilot projects in order to advance social and economic development in their target States and regions. The Group noted that there are many regional and multilateral capacity-building programmes already in place. In particular, the United Nations Programme on Space Applications is a well-established capacity-building programme that would benefit from further support from spacefaring countries. Other international organizations such as the United Nations Educational, Scientific and Cultural Organization, WMO and ITU contribute specific capacity-building programmes in their respective areas of competence. Capacity-building programmes are also available, in various formats, at the bilateral level. Such programmes are often associated with a specific cooperation agreement.

56. Adoption of an open satellite data-collection and dissemination policy for sustainable economic and social development would be consistent with General Assembly resolution 41/65, entitled "Principles relating to remote sensing of the Earth from outer space". In promoting data dissemination policies, States could also consider establishing programmes aimed at training and educating users in developing countries to receive and interpret relevant satellite-based data and to make such data available, useful and accessible to domestic and international end users. The Group noted that some States already disseminate free remote sensing data for the promotion of economic and social development. The Group also noted that the importance of space-technology-based data, in situ monitoring and reliable geospatial information for sustainable development was recognized in paragraph 274 of the outcome document of the United Nations Conference on Sustainable Development, held in Rio de Janeiro, Brazil, from 20 to 22 June 2012, entitled "The future we want" (General Assembly resolution 66/288, annex).

VI. Consultative mechanisms

57. Timely and routine consultations through bilateral and multilateral diplomatic exchanges and other government-to-government mechanisms including bilateral, military-to-military, scientific and other channels, can contribute to preventing mishaps, misperceptions and mistrust. They may also be useful in:

(a) Clarifying information regarding the exploration and use of space, including for national security purposes;

(b) Clarifying information provided on space research and space applications programmes;

(c) Clarifying ambiguous situations;

(d) Discussing the implementation of agreed transparency and confidence-building measures in outer space activities;

(e) Discussing the modalities and appropriate international mechanisms for addressing practical aspects of outer space uses;

(f) Preventing or minimizing potential risks of physical damage or harmful interference.

58. States are encouraged to consider using existing consultative mechanisms, for example those provided for in article IX of the Outer Space Treaty and in the relevant provisions of the ITU Constitution and Radio Regulations.

59. The Group was of the opinion that its establishment, work and consultative function serve as transparency and confidence-building measures in their own right.

VII. Outreach

60. Outreach measures can improve understanding between States as well as regional, multilateral, non-governmental and private sector cooperation. The implementation of political and diplomatic outreach measures relating to outer space activities can help to promote the security of all States by fostering mutual trust. Specific measures may include States' participation in thematic workshops and conferences on space security issues.

61. Spacefaring States should inform the Secretary-General, the general public and the international scientific community of the nature, conduct, locations and results of outer space activities, in accordance with the Outer Space Treaty.

62. The Group noted the important intellectual contribution of international organizations and non-governmental organizations to facilitating outreach activities. Such activities provide an opportunity for all States and other relevant stakeholders to develop constructive dialogue. Within the United Nations system, the work of the Office for Outer Space Affairs, the Office for Disarmament Affairs and the United Nations Institute for Disarmament Research are of particular note. States should actively encourage all stakeholders, including academia and non-governmental organizations, to actively participate in raising public awareness about outer space policies and activities.

VIII. Coordination

63. States are encouraged, including through national space agencies or other authorized entities, existing mechanisms and international organizations, to promote the coordination of their space policies and space programmes in order to enhance the safety and predictability of the uses of space. In support of that goal they may also conclude bilateral, regional or multilateral arrangements, in accordance with multilateral commitments.

64. The Group considered that coordination among multilateral organizations engaged in developing transparency and confidence-building measures for outer space activities is essential. Such coordination should be carried out in accordance with the respective mandates of those organizations.

65. The Group agreed that, for the purpose of strengthening coordination in outer space activities, States, international organizations and private sector actors conducting space programmes should establish focal points for coordination.

66. The Group recommended that coordination be established between the Office for Outer Space Affairs, the Office for Disarmament Affairs and other appropriate United Nations entities on matters related to transparency and confidence-building measures for outer space activities. The Group also considered that a United Nations

inter-agency mechanism could provide a useful platform for the promotion and effective implementation of transparency and confidence-building measures for outer space activities.

67. States should seek to participate, to the maximum extent possible, in the outer space-related activities of intergovernmental entities of the United Nations system, such as the Conference on Disarmament, ITU, WMO, the Commission on Sustainable Development and any of their successor bodies. States conducting space activities should actively participate, as members or observers, in activities of the Committee on the Peaceful Uses of Outer Space.

IX. Conclusions and recommendations

68. The Group of Governmental Experts recommends that States and international organizations, on a voluntary basis and without prejudice to the implementation of obligations deriving from existing legal commitments, consider and implement the transparency and confidence-building measures described in the present report.

69. The Group endorses efforts to pursue political commitments, for example in the form of unilateral declarations, bilateral commitments or a multilateral code of conduct, to encourage responsible actions in and the peaceful uses of outer space. The Group concludes that voluntary political measures can form the basis for consideration of concepts and proposals for legally binding obligations.

70. The Group encourages States to review and implement the proposed transparency and confidence-building measures through relevant national mechanisms on a voluntary basis. Such measures should be implemented to the greatest extent practicable and in a manner that is consistent with States' national interests. As specific unilateral, bilateral, regional and multilateral measures are agreed to, States should regularly review the implementation of the measures and discuss any additional ones that may be necessary, including those required owing to advances in the development of space technologies and in their application.

71. In order to build confidence and trust among States, the Group recommends universal participation in, implementation of and full adherence to the existing legal framework relating to outer space activities, which includes: the Outer Space Treaty; the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space; the Convention on International Liability for Damage Caused by Space Objects; the Registration Convention; the ITU Constitution, Convention and Radio Regulations, as revised; the Convention of the World Meteorological Organization, as amended; the Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and under Water; and the Comprehensive Nuclear-Test-Ban Treaty. States that have not yet become parties to the international treaties governing the use of outer space should consider ratifying or acceding to those treaties.

72. The Group also recommends that the General Assembly decide how to further advance transparency and confidence-building measures and provide for their universal consideration and support, including by referring the above recommendations to the Committee on the Peaceful Uses of Outer Space, the Disarmament Commission and the Conference on Disarmament for consideration, as appropriate. The First and Fourth Committees of the General Assembly may also

decide to hold a joint ad hoc meeting to address possible challenges to space security and sustainability.

73. The Group further recommends that Member States take measures to implement, to the greatest extent practicable, principles and guidelines endorsed on the basis of consensus by the Committee on the Peaceful Uses of Outer Space and the General Assembly. Member States should also consider, where appropriate, taking measures to implement other internationally recognized space-related principles.

74. The Group encourages relevant international intergovernmental and non-governmental organizations to consider and implement the proposed transparency and confidence-building measures as appropriate and to the greatest extent practicable.

75. The Group recommends that the Secretary-General circulate the present report to all relevant entities and organizations of the United Nations system in order that they may assist in effectively implementing the conclusions and recommendations contained within it.